

CENTRE FOR  
**Eye Research  
Australia**




# **BUILDING 20/20 VISION**

ANNUAL  
REPORT | **2016**


[www.cera.org.au](http://www.cera.org.au)

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For regular updates on CERA research visit:

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Giving more people  
living with eye disease  
**a chance to save  
their sight**

### OUR VISION

To save sight and change lives  
through research that matters

### OUR MISSION

We are leading the way in innovative  
eye research that makes a difference  
in people's lives

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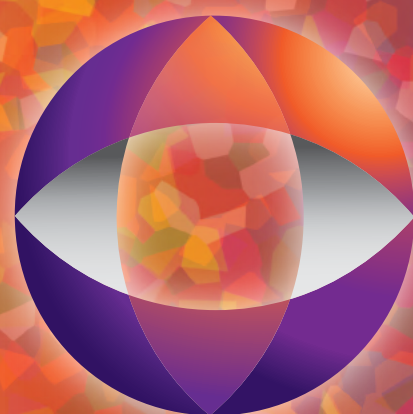
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# CENTRE FOR Eye Research Australia 1996-2016

Celebrating 20 years as the Centre for Eye Research Australia

## Past and current Managing Directors

The Centre for Eye Research Australia (CERA) celebrated 20 years of ground-breaking work in eye research in 2016. The milestone was commemorated with a celebration and brought together many researchers, staff and supporters, past and present. Mr Peter Nankivell, CERA Chair, opened the festivities with a video highlighting CERA's history and hopes for the future. Past Managing Directors, Profs Hugh Taylor AC and Tien Wong and current Managing Director, Prof Jonathan Crowston entertained the 200 guests with reflections of their time at CERA, and how proud they are of how the organisation has grown.

» To view the 20th anniversary video, please visit our website [www.cera.org.au](http://www.cera.org.au)



**Laureate Prof Hugh Taylor AC**  
**1996 - 2007**

"When I arrived in 1990 at the University of Melbourne Department of Ophthalmology there was huge potential, so I thought let's pull together the hospital, the profession, the college and the associations advocating for the blind with the University in a new entity and call it the Centre for Eye Research Australia...and it is so exciting to see how well CERA is doing, the growth that has occurred and how strong it has become."



**Prof Tien Wong**  
**2008**

"CERA is now one of the best professional teams that is globally competitive, and our fundamental research focused on solving blindness and vision loss is world-class.

CERA is accepting of different cultures and backgrounds. It is an outward-looking international organisation, taking the best people...whoever wants to contribute, whoever has a real passion for research."



**Prof Jonathan Crowston**  
**2009 - present**

"The patient sits at the centre of all the research that we do, and the new technologies allowing us to image the eye and measure the ocular function are going to have a major impact on our ability to diagnose and monitor eye disease. The eye is a useful indicator for other diseases such as dementia, Parkinson's and cardiovascular diseases and will soon become an even more useful barometer of a person's general health.

I'd like to see CERA have a tangible impact on combating eye disease, and that after another 10 years we could say we stopped even more people from losing their vision."



# Chair and Managing Director message



**Mr Peter Nankivell and Prof Jonathan Crowston**

In 1996, The Centre for Eye Research Australia (CERA) was launched by Laureate Prof Hugh Taylor AC with the goal of conducting eye research with real-life impact. With a staff of six and a vision for what was possible, CERA set out to build the partnerships and connections that would be essential to our success today. Thanks to the perseverance, hard work and determination of that early group, CERA has become the leading Australian institute for eye research.

2016 was a period of consolidation for CERA. Having put a new organisational structure in place, we continue to lay the foundations for the future.

Now CERA looks to the next 20 years as we take another step forward to become a world-class centre of integrated vision research, translation and innovation – where clinicians, patients, researchers and industry come together to develop treatments and technologies that transform patient lives.

Building upon the foundations of 2015, we have further developed our comprehensive research program by focusing on three integrated themes concentrating on translational research:

- 1. Ageing Eye Diseases** – Conducting excellent research to combat eye disease and reduce vision impairment in the community
- 2. Vision Regeneration** – Conducting research to enable the restoration of vision
- 3. Products and Pathways to Patients** – Building our capacity to develop products and deliver translational outputs that will positively influence clinical practice, policy and research

These research themes allow us to consolidate our work by focusing on major projects being addressed by researchers in a collaborative manner, with a view to increase our impact. You will notice our annual report highlights are structured around these three pillars to showcase our researchers' wonderful work in each area.

Such highlights include Dr Isabel Lopez Sanchez working on identifying the links between mitochondrial dysfunction (faults in our cellular 'battery packs') and eye disease.

Or consider the award-winning work of Assoc Profs Alex Hewitt and Alice Pébay on emerging gene

editing techniques to develop novel therapies to cure life-threatening or debilitating eye diseases.

Another highlight is an unprecedented corneal treatment, developed by Assoc Prof Mark Daniell, Dr Karl Brown and Dr Berkay Ozcelik.

We are proud to showcase CERA's efforts in creating products and patient solutions for the digital age. Prof Mingguang He's team is working with Google to develop an app that brings eye care to those in regional and remote communities who do not have access to eye care professionals. Prof Robyn Guymer's team is creating an app that detects changes in eye health in the home and alerts the user and their clinician of any deterioration.

So, what will success look like in the run up to 2020?

We will continue to build our leadership capability, skills development and mentoring capacity to attract the best talent from around the globe. CERA is and will continue to be Australia's leading centre of vision research and innovation – where knowledge is translated into life-changing treatments and cures for patients.

Finally, we wish to sincerely thank and acknowledge all our supporters, whose generosity provides the critical support and encouragement to our researchers and clinicians as they strive to create a world free from blinding eye disease. We look forward to keeping you informed of our progress and to continuing our journey together.

Mr Peter Nankivell  
**Chair**

Prof Jonathan Crowston  
**Managing Director**

PS - We were honoured to have her Excellency the Honourable Linda Dessau AC, Governor of Victoria, patron of CERA, unveil a plaque at the Lions Eye Donation Service's 25th anniversary. Read more about the celebrations on page 35.

*"Building 20/20 Vision is reflected in the work we do at CERA - a vision to save sight and change lives through research that matters."*



Prof Jonathan Crowston and Mr Peter Nankivell

# History & highlights



## 20 YEARS OF MAKING HISTORY TOGETHER

In 2016 CERA celebrated 20 years as an independent Medical Research Institute. CERA is a collaborative undertaking between the University of Melbourne (UoM), The Royal Victorian Eye and Ear Hospital (RVEEH), the Lloyd and Kathleen Ansell Ophthalmology Foundation, CBM Australia, Diabetes Victoria, Glaucoma Australia, the Royal Australian and New Zealand College of Ophthalmologists (RANZCO), Vision Australia Ltd and the Victorian Lions Foundation Inc.

### 1996-1999

- Laureate Prof Hugh Taylor AC establishes CERA
- CERA designated as Australia's only World Health Organization Collaborating Centre for the Prevention of Blindness (1992)
- Laureate Prof Hugh Taylor's "Eye Health in Aboriginal and Torres Strait Islander Communities" review was published by the Commonwealth Department of Health and Family Services. Recommendations implemented nation-wide
- Record number of donors for the Eye Bank and waiting list for corneal grafts at its lowest level ever, due to the hard work of Drs Grant Snibson and Graeme Pollock
- International breakthrough – gene discovered for two inherited forms of macular degeneration

### 2000-2003

- Victorian Minister of Health, the Honourable John Thwaites helps CERA launch book "Eye Care for the Community" – setting out a clear agenda for work that needed to be done to address the issue of vision and eye care for the next 20 years
- CERA one of the lead agencies to create new national body "Vision 2020: The Right to Sight Australia" – a peak body for all those who work on vision
- Laureate Prof Hugh Taylor AC receives Order of Australia
- Lions Eye Health Program Australia extended nationally - from Western District of Victoria to Australia-wide
- Laureate Prof Hugh Taylor AC receives the Mildred Weisenfeld Award – the first time an Australian has been awarded the Association for Research in Vision and Ophthalmology's highest award for excellence in ophthalmology
- Vision Cooperative Research Centre established with Australian Government funding of \$32 million over seven years

### 2004-2007

- CERA launches "Clear Insight" report on economic impact and cost of vision loss in Australia
- Prof Tien Wong joins CERA and introduces retinal imaging technologies to predict cardiovascular risk
- Lions Eye Donation Service opens
- Prof Jonathan Crowston joins CERA and expands laboratory-based scientific research capability
- CERA is a major partner in the Bionic Vision Australia consortium to create Australia's Bionic Eye
- Laureate Prof Hugh Taylor AC resigns as Managing Director, having established CERA as an independent vision-focussed Medical Research Institute
- Community Information Forums program started with one session on glaucoma

### 2008-2012

- Prof Tien Wong appointed Managing Director of CERA in 2008 - returns to Singapore in 2009 as Director of the Singapore Eye Research Institute
- Prof Jonathan Crowston launches "Tunnel Vision", a ground-breaking report into glaucoma
- First Annual Gerard Crock lecture established in 2008
- Prof Jonathan Crowston appointed Managing Director of CERA in 2009
- Victorian Government announces a multi-million dollar refurbishment of the RVEEH providing new facilities for CERA patients and staff
- First annual Scientific Exchange in 2010
- CERA benchmarked among top eye research centres in the world for research output
- Patients receive first bionic eye implant
- Assoc Prof Alice Pébay joins and expands CERA's stem cell/gene therapy research capability
- Prof Robyn Guymer advances development of a new nanosecond laser to treat early stages of AMD

### 2013-2015

- CERA celebrates 50 years as the University of Melbourne, Department of Ophthalmology in 2013
- CERA establishes collaboration with Glaucoma Australia and Diabetes Australia to strengthen connection to patient community
- Important NHMRC & ARC grants for stem cell research
- CERA the clinical lead in the successful completion of the first bionic eye - an ARC Special Research initiative
- Assoc Prof Wilson Heriot develops 'retinal thermofusion' technique - first significant change in the method of sealing retinal tears in a century
- Organisation re-structure with an increased focus on commercialisation of research and diversifying funding streams
- Relocation of several research teams to new lab space within the Baker IDI Heart and Disease Institute thus further expanding CERA's research capability

### 2016-present

- CERA celebrates its 20th anniversary
- New CERA facilities open at Eye and Ear on the Park thus enhancing CERA's clinical trials capability
- National Eye Health Survey report launched with Vision 2020 Australia to national acclaim

## 2016 Highlights



**Won 24 competitive grants totalling \$5.21 million**



**211 research papers published by CERA researchers**



**20 clinical trials helping more than 300 patients**



**2,215 donations and 11 bequests totalling \$1,992,788**



**4 Community Information Forums with more than 400 guests**



**Moved staff from the Clinical Trial Research Centre to Eye and Ear on the Park, and moved into Level 7 of The Royal Victorian Eye and Ear Hospital**



# CERA Board Members & Committees

## CERA Board Members



Mr Peter Nankivell  
(Chair)



Dr Malcolm  
Brown



Mr Andrew  
Cowlshaw (Treasurer)



Prof Jonathan  
Crowston



Ms Christine  
Edwards



Ms Olivia  
Hilton



Mr James  
Joughin



Mr Peter  
Larsen



Prof Geoff  
McColl



Ms Wendy  
Miller



Ms Brigitte  
Smith



Prof Robert  
Williamson AO

In 2016, we farewelled long-standing Board members Mr James Joughin and Prof Robert Williamson AO. We are very grateful to them for their years of dedicated service. We also welcomed two new Board members Mr Andrew Cowlshaw and Ms Wendy Miller.

## Executive Committee

- **Prof Jonathan Crowston**  
Managing Director
- **Prof Robyn Guymer**  
Deputy Director
- **Ms Jacinta Mackey**  
Head of Finance & Business Excellence
- **Mr Michael Grigoletto**  
External Relations Manager
- **Dr Ann Du**  
Grants & Research Portfolio Manager
- **Ms Julie Todaro**  
Head of People Development
- **Dr Melissa Knight**  
Head of Business Development & Partnerships
- **Prof Paul Baird**  
Research Lead – Education
- **Dr Peter van Wijngaarden**  
Research Lead – Scientific Excellence
- **Dr Mohamed Dirani**  
Research Lead – Translation & Funding
- **Prof Darren Kelly**  
Head of Strategy & Mentoring
- **Prof Mingguang He**  
Research Lead – International Partnerships

## Committees reporting to the Board

### Finance and Risk Committee (FRC)

The FRC reviews the financial planning and management of the company, financial reporting, statutory compliance obligations, as well as overseeing risk management and commercialisation activities.

In February 2016, Mr James Joughin resigned from the Board as Treasurer and Chair of the FRC. Following his departure, Mr Andrew Cowlshaw was appointed as Treasurer and Chair of the FRC. The Committee also includes Directors Mr Peter Nankivell, Prof Jonathan Crowston, and Mr Peter Larsen.

### Nominations and Appointments Committee (NAC)

The NAC considers and advises on succession planning and new appointments to the Board and senior research and management staff.

The Committee was chaired by Mr Peter Nankivell and its members were Directors Ms Olivia Hilton and Profs Geoff McColl and Jonathan Crowston.

### Research Advisory Committee (RAC)

In 2016, a new structure and purpose for the RAC was implemented. The RAC's purpose is to improve the quality and impact of research undertaken at CERA and assist the Managing Director to establish research priorities. The Committee was chaired by Ms Brigitte Smith and its members were Ms Christine Edwards and Profs Matthew Bailes, Mark Cook, Bronwyn Kingwell, Steven Petrou and Jonathan Crowston.

# RESEARCH THEME 1: Ageing Eye Disease

Conducting excellent research to combat eye disease and reduce vision impairment in the community





Dr Stuart Keel, Dr Mohamed Dirani, Prof Hugh Taylor AC, Mr Josh Foreman

## Eye on research: Results from Australia's first national survey on eye health

Results from the first and most comprehensive nationwide eye health survey released by CERA and Vision 2020 Australia on World Sight Day raised concerns about vision health, especially among the country's Indigenous and regional communities.

Australia's population is rapidly ageing and undiagnosed eye diseases that particularly affect seniors, such as glaucoma, are a looming problem.

Principal Investigator Dr Mohamed Dirani said the survey, which looked at the prevalence of vision loss in both Indigenous and non-Indigenous people, was ground-breaking in its robustness and set an international benchmark for research into major causes of vision impairment.

The National Eye Health Survey (NEHS) found vision impairment rates appear to be on the decline, with diagnosed cases lower in Australia compared to other developed countries. It also revealed that, after age adjustment, Indigenous Australians are three times more likely to have a vision impairment compared with non-Indigenous Australians.

"While Indigenous eye health has been improving particularly with increased diabetic eye checks, this is a very worrying statistic that must not be ignored by Governments and health authorities," said Dr Dirani.

Another important outcome was that the survey identified that a third of the 4,836 participants had an eye condition they were unaware of. As a result of the survey these people were referred to an eye health professional.

"It is vital people take eye health seriously and make sure they get regular examinations, as most sight-threatening eye conditions have little to no symptoms in the early stages," said Dr Dirani.

A follow-up to the NEHS is being planned to assess the progress of reducing the prevalence of vision impairment.

*The National Eye Health Survey was conducted in partnership with Vision 2020 Australia and was supported by funding from the Australian Government under the Chronic Disease Prevention and Service Improvement Fund, with other contributions coming from CERA, OPSM, Novartis, Zeiss, Brien Holden Vision Institute, Optometry Australia, National Aboriginal Community Controlled Health Organisation and the Royal Flying Doctor Service.*

## When the cell's powerhouse is faulty: Identifying the link between mitochondrial dysfunction and eye disease

Does a glitch in our mitochondrial DNA play a role in the onset of primary open-angle glaucoma (POAG) and other debilitating eye diseases? The mounting evidence shows that it does.

Dr Isabel Lopez Sanchez and her team are addressing this fundamental question in the research of ageing eye diseases.

Mitochondria are the powerhouse of our cells, generating most of the energy we use through a chemical process called oxidative phosphorylation. When a problem with mitochondria impacts on this energy process, cell function can be negatively affected.

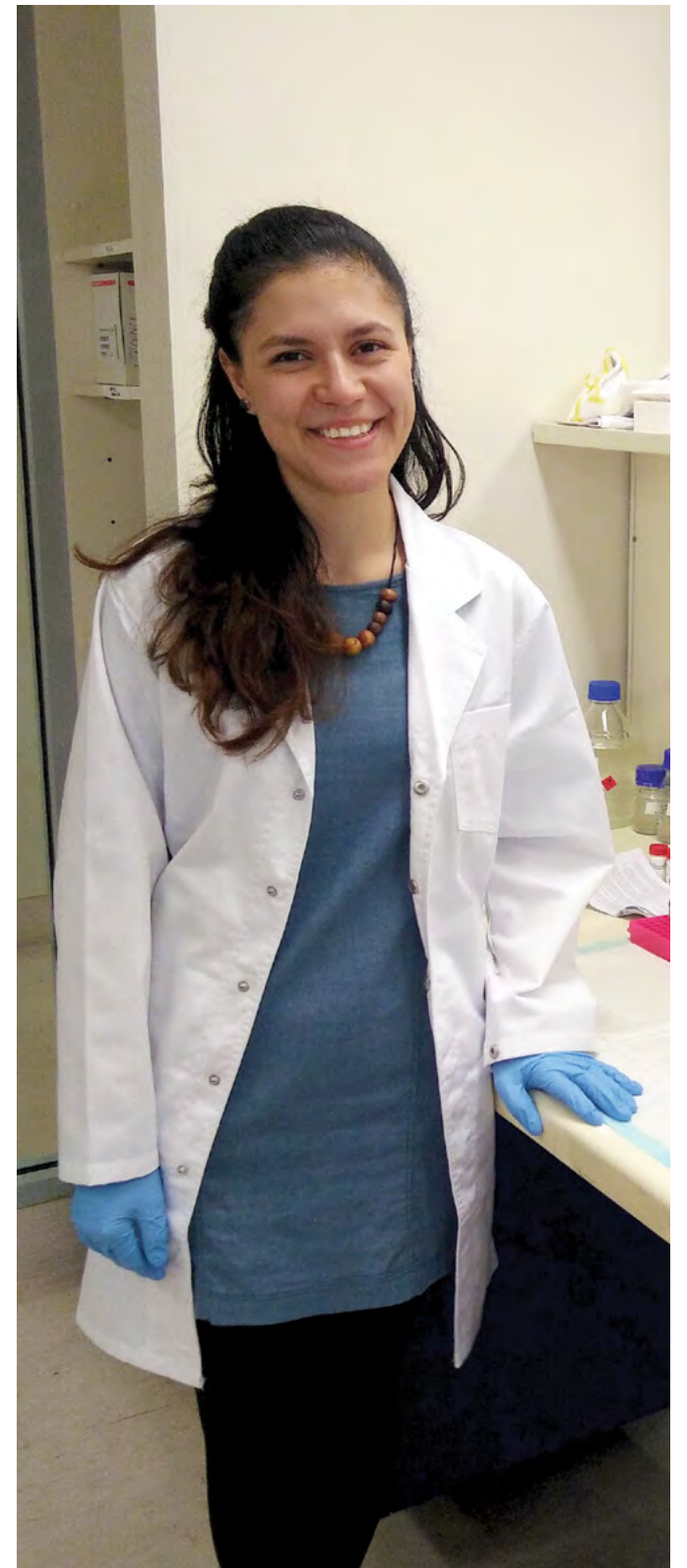
"I focus on a tiny genome which is maternally inherited called mitochondrial DNA, and even though only 13 genes are involved, they are critical for life and vital for visual function," said Dr Lopez Sanchez.

Dr Lopez Sanchez's research detected mitochondrial impairment in people with POAG. In addition her team has also identified mitochondrial impairment in the blood of patients.

This is a significant finding as it means that a blood test could be developed as a potential biomarker for glaucoma and other eye-related diseases. Dr Lopez Sanchez is now looking to expand a pilot trial to sequence the full mitochondrial DNA of 1,000 POAG patients and 1,000 controls.

"If we can identify mitochondrial DNA dysfunction in a large group of patients with POAG, we can then redirect therapeutic strategies towards treatments that increase cell energy efficiency with the goal of restoring optic nerve health," said Dr Lopez Sanchez.

In 2016 Dr Lopez Sanchez received a Health Travel Fellowship from the Harold Mitchell Foundation which allowed her to present her research at the German Ophthalmological Society Congress in Berlin, and visit the Autophagy in Health and Disease Group led by Dr Patricia Boya at the Centre for Biological Investigation in Madrid, Spain.



Dr Isabel Lopez Sanchez





Dr Flora Hui and Dr Jess Tang

## To stop a thief...

There are good reasons glaucoma is called the 'thief of sight' especially amongst the aged. One in ten people over the age of 80 are affected and an estimated 300,000 have this devastating disease, but only half that number have been diagnosed.

CERA's Glaucoma research group, led by renowned expert in the field, Prof Jonathan Crowston, is working on the development of more effective and less invasive treatments. Their aim is to create better tools to diagnose and monitor glaucoma earlier and more reliably to improve the chances of saving sight.

CERA Research Fellow Dr Flora Hui and PhD student Dr Jess Tang are studying different aspects of the disease. Dr Hui is looking at the impact of Vitamin D supplements and Dr Tang is focussing on ways to improve patient monitoring.

"There's a real gap in managing glaucoma...we need a test that is more objective to monitor patients better to tell us if there has been change in the short-term," said Dr Tang.

Better monitoring of patients will lead to better health outcomes and a chance to stop the 'thief of sight' in its tracks.

## New treatments for AMD using 'good cholesterol' and computer algorithms

Age-related macular degeneration (AMD) is the leading cause of severe and irreversible vision loss that occurs with ageing.

A project being undertaken by Dr Hitesh Peshavariya of the Oxidant Signalling group, is looking at common risk factors for AMD including age, inflammation and dietary fat intake.

"We are looking at the impact of 'good cholesterol' - reconstituted high-density lipoproteins (rHDLs) - in a mouse model of AMD to see if they reduce the early signs of the disease. rHDLs have already been used as a preventative for conditions with similar risk factors," said Dr Peshavariya.

Head of Ocular Genetics, Prof Paul Baird's approach to tackling AMD is to identify interactions at the

genetic level of the disease through novel computing algorithms.

"Through the International AMD Consortium, we have access to the largest collection of AMD samples in the world to conduct large scale genomic studies to understand genetic interactions that cause eye disease. This will help us develop gene-based treatments for AMD," said Prof Baird.

## RESEARCH THEME 2: Vision Regeneration

Conducting research to enable the restoration of vision







## Why we need a 'gene atlas' of the retina

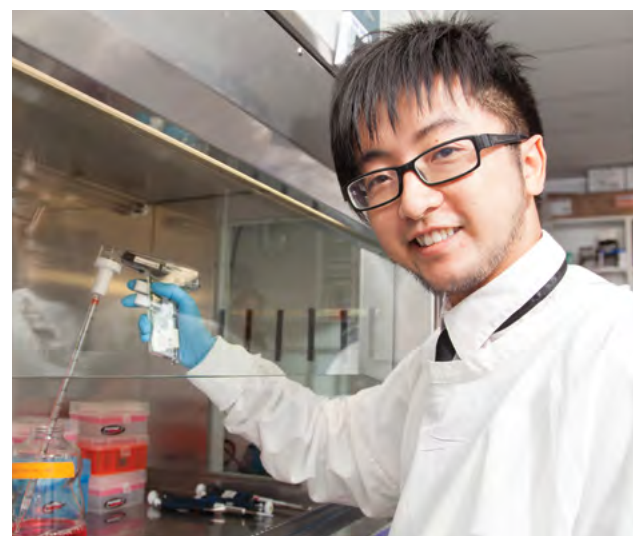
Despite advances in vision research, due to its extraordinary complexity, the retina still holds many mysteries and presents great challenges for researchers. The function and differences between cells and sub-types of each cell in the retina is not well understood.

Dr Raymond Wong, Head of CERA's Cellular Reprogramming group has set an ambitious goal to discover the gene expression for each cell type and create what he calls a 'gene atlas of the retina.' This will enable the reclassification of the retinal cell types and allow us to understand the biology of the eye at the single cell level. This approach has already been used for the pancreas and the cortex, but we have yet to see it in the human eye. Dr Wong believes it could revolutionise our understanding of eye disease and uncover the potential for vision regeneration.

"A broad picture of what is happening in the retina can be produced with gene expression transcription of the whole retina, but the granular detail of an individual cell is missed, and this is where we need to be if we are to understand cellular function," said Dr Wong.

Dr Wong and his team will access human retina tissues for single cell transcriptome analysis in collaboration with the Lions Eye Donation Service at CERA.

The short-term goal will be to identify biomarkers for the cell sub-types of the retina, and the long-term goal is to use those findings to create a better understanding, at the cellular level, of how ageing and degenerative retinal disorders affect the different retina cells.



Dr Raymond Wong



Dr Berkay Ozcelik



Assoc Prof Mark Daniell



Dr Karl Brown

## New corneal film treatment could save sight

An unprecedented treatment could have the potential to restore eyesight for people with serious corneal damage or disease.

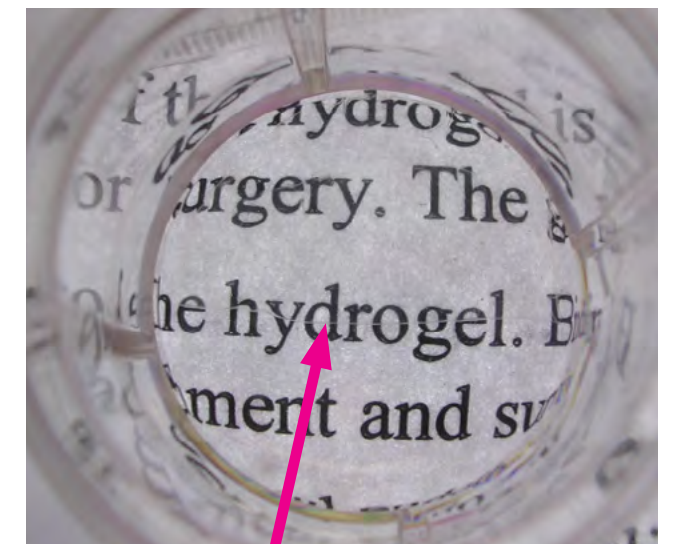
Assoc Prof Mark Daniell, Head of Surgical Research, CERA; Dr Karl Brown, Research Fellow, CERA and Dr Berkay Ozcelik from the University of Melbourne (UoM) were part of a group of researchers who developed a technique to grow corneal cells in the lab that can be transplanted into the eye.

"A damaged cornea can be replaced with a transplant, but when the innermost and thinnest layer of the cornea - the endothelium - is damaged there are greater challenges, and these make vision regeneration very difficult," explained Dr Karl Brown.

Assoc Prof Daniell elaborates further that the main problem they have had with corneal transplants is cell rejection and "you wouldn't get rejection if they were your own cells".

Dr Ozcelik, Polymer Science Group, UoM, worked with CERA to develop the synthetic film used to support new corneal cells. The technique will help grow patients' own corneal cells which minimises the risks that occur during transplantation. This approach has already shown real promise and the next phase of the study will be to validate the treatment in clinical trials.

With more than 2,000 corneal transplants conducted in Australia annually, and a world-wide shortage of corneas, this breakthrough has profound implications for corneal donors and potential benefits for the many thousands of people globally with corneal disease.



In this picture a film is folded in half, you might just be able to see the fold line running through the word 'hydrogel'. The film is transparent and readily unfolds smooth and flat. It is half the thickness of human hair and strong enough to be drawn through a tiny incision during surgery.





**Clinical Genetics and Neuroregeneration teams**

Back row - Assoc Prof Alex Hewitt, Ms Lisa Kearns, Dr Sandy Hung, Dr Damian Hernandez, Mr Maciej Daniszewski, Dr Duncan Crombie, Dr Paul Sanfilippo

Middle row - Dr Raymond Wong, Ms Linda Clarke, Dr Fan Li, Ms Alison Conquest, Dr Seema Mandhare, Dr Elisabeth De Smit

Front Row - Ms Sandra Staffieri, Assoc Prof Alice Pébay, Dr Helena Liang, Ms Tejal Kulkarni, Ms Grace Lidgerwood

# Developing gene editing techniques to treat eye disease

A collaborative effort led by Assoc Prof Alex Hewitt, has made progress with a project that involves the editing of mouse genomes *in vivo*.

Gene editing uses a naturally occurring phenomenon called CRISPR to effectively cut and paste DNA inside living cells. The technique is still experimental, but ultimately faulty genes that cause eye disease in a person’s genetic code could potentially be deleted, replaced and corrected.

Gene editing could be undertaken in adults or children and this introduces the possibility to genetically edit embryos during *in vitro* fertilisation, meaning positive genetic changes would be passed onto the next generation to prevent disease.

Dr Sandy Hung and Dr Rick Liu of the team lead this exciting work and successfully introduced components of gene editing into the retina of a mouse. The research group were excited to be the first in the world to report these findings in *Investigative Ophthalmology & Visual Science*.

*“As exciting as our data is, we still have much work ahead to ensure the technology is safe and efficient,”*  
- Assoc Prof Hewitt

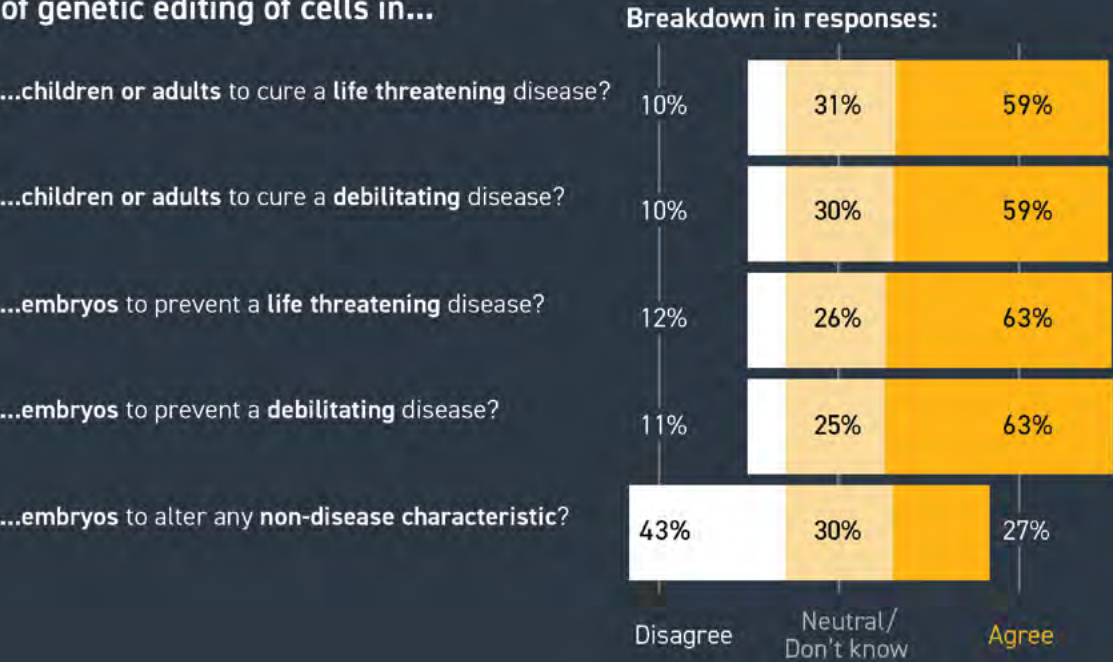
## Survey results show public support for gene editing

A survey led by Assoc Profs Alex Hewitt and Alice Pébay, in conjunction with the University of Melbourne, Menzies Institute for Research, University of Tasmania and Monash University found that approximately two out of three people support gene editing.

The results of the survey, published in *Cell Stem Cell*, showed that 59 percent of the 12,000 respondents from 185 countries agreed with gene editing to cure life threatening or debilitating diseases in adults and children.



### How much do you agree with the use of genetic editing of cells in...







Veski Fellowship Awardees

## HOVER: Creating an international consensus on the efficacy of vision restoration

CERA's Dr Lauren Ayton, Clinical Research Team Leader of the Bionic Eye project, played a key role in the first successful human clinical trial of a retinal prosthesis.

"The goal of my research is to develop novel treatments for blindness and methods for assessing outcomes in vision restoration clinical trials. I am particularly interested in developing more accurate ways to measure a person's level of vision at the extreme ends of the vision loss spectrum - be it people with the earliest signs of a risk of losing vision at the initial stages of disease or those with extremely poor vision," said Dr Ayton.

There is no accepted international standard for measuring vision loss when the loss is severe.

Together with Prof Joseph Rizzo of Harvard University, Dr Ayton is the Founder and Chair of the International Taskforce for Harmonization of Outcomes and Vision Endpoints in Vision Restoration Trials (HOVER).

"HOVER brings together over 100 of the world's leading researchers in vision restoration and we are working toward creating a globally accepted gold standard to measure vision restoration," said Dr Ayton.



Dr Lauren Ayton and Prof Robyn Guymer

## RESEARCH THEME 3: Products and Pathways to Patients

Build our capacity to develop products and deliver translational outputs that will positively influence clinical practice, policy and research







Assoc Prof Michael Coote

## Pressure down: Creating surgical treatments for glaucoma

Glaucoma is a group of eye diseases which result in damage to the optic nerve and vision loss. One of the leading risk factors for glaucoma is an increase in pressure in the eye (intraocular pressure).

Assoc Prof Michael Coote, a Principal Investigator at CERA and the Clinical Director of Ophthalmology at The Royal Victorian Eye and Ear Hospital, has been working for 20 years to investigate and improve surgical solutions for glaucoma.

"Glaucoma is a treatable disease...and there is absolutely no one that should be putting up their hand and saying that there is nothing I can do for it – no-one!" said Assoc Prof Coote.

Tiny devices (smaller than a pinhead) have been developed that are placed within the eye to restore the normal functions enabling fluids to move around, escape or be reabsorbed within the eye.

"One aspect of glaucoma is a plumbing deal and we have a certain amount of fluid that we need to remove from (or redistribute within) the eye within a certain pressure tolerance," he said using an apt analogy for this dynamic within the eye.

Assoc Prof Coote said he is excited about surgical developments that are coming to help patients with glaucoma.

"There are some things on the horizon that give us some comfort. We have new implants that are being used around the world – so-called MIGS (minimally invasive glaucoma surgery) devices."

When asked about his motivations for conducting research at CERA, in addition to his clinical practice, Assoc Prof Coote said, "...research, in the end, is meant to make patients better. It is meant to give us alternatives. It is meant to create a better future than the past."



Google Impact Challenge 2016 winners

Dr William Yan with his trophy

## Tyranny of distance: Fighting endemic eye disease in remote and regional communities

The largest challenge to preventable eye disease is the lack of access to eye care services in primary healthcare settings, particularly in regional, remote and Indigenous communities.

Thanks to a group of CERA researchers and the generosity of Google, we have created an innovative solution called Vision At Home, which may greatly improve the situation as it can be easily accessed from a home computer or mobile phone. Vision At Home is a prototype software package and supporting referral platform for use worldwide by those who do not have access to eye care professionals.

A team led by Prof Mingguang He, Professor of Ophthalmic Epidemiology and PhD candidate, Dr William Yan, presented their project as finalists in the 2016 Google Impact Challenge.

In the face of fierce competition from hundreds of entries, Vision At Home, presented by Dr Yan, won \$750,000 in prize money to develop the technology.

"Less than 1% of eye specialists work in remote Australia. Our ultimate goal is to help those who can't easily get to treatment and bring testing to areas with poor access," said Dr Yan.

Working together with Dr Andreas Mueller, Deputy Director of the World Health Organization Collaborating Centre for the Prevention of Blindness (WHO CC) at CERA, they are planning on conducting a clinical validation study to ensure that it produces the same accuracy as accepted clinical standards, and beta studies in aged care facilities, schools and patients' homes.

### Realising universal eye health across the Asia Pacific

The WHO CC for the Prevention of Blindness applies evidence-based research to improve the effectiveness and quality of eye care services in the Asia Pacific with the goal of making them accessible to all, no matter how remote, particularly in underdeveloped countries.

A project initiated in 2016 has the potential to revolutionise eye-testing among lower income groups in remote and regional areas. Images of the eye taken with any fundus camera can access cloud-based

software which automatically grades the eye for the four main eye diseases; cataracts, glaucoma, diabetic retinopathy and AMD.

The project is inspiring interest in countries and in the region whose populations will benefit from better and faster testing.



# Enhancing CERA's clinical trials capability – bringing treatments to patients

CERA's Clinical Trials Research Centre (CTRC) ran 20 clinical trials during the year treating over 300 patients for a wide range of conditions including diabetic eye disease, age-related macular degeneration, glaucoma, uveitis, dry eye, and other retinal diseases.

CTRC saw enormous positive changes in 2016 with a move to new premises at the Eye and Ear on the Park, and an organisation-wide implementation of standard operating procedures improving services and benefiting hundreds of patients.

The new facilities provide CERA with the capacity to run more trials with dedicated assessment and treatment rooms for patients. A relocation of the outpatient clinic at The Royal Victorian Eye and Ear Hospital has enabled seamless access to patients and doctors.

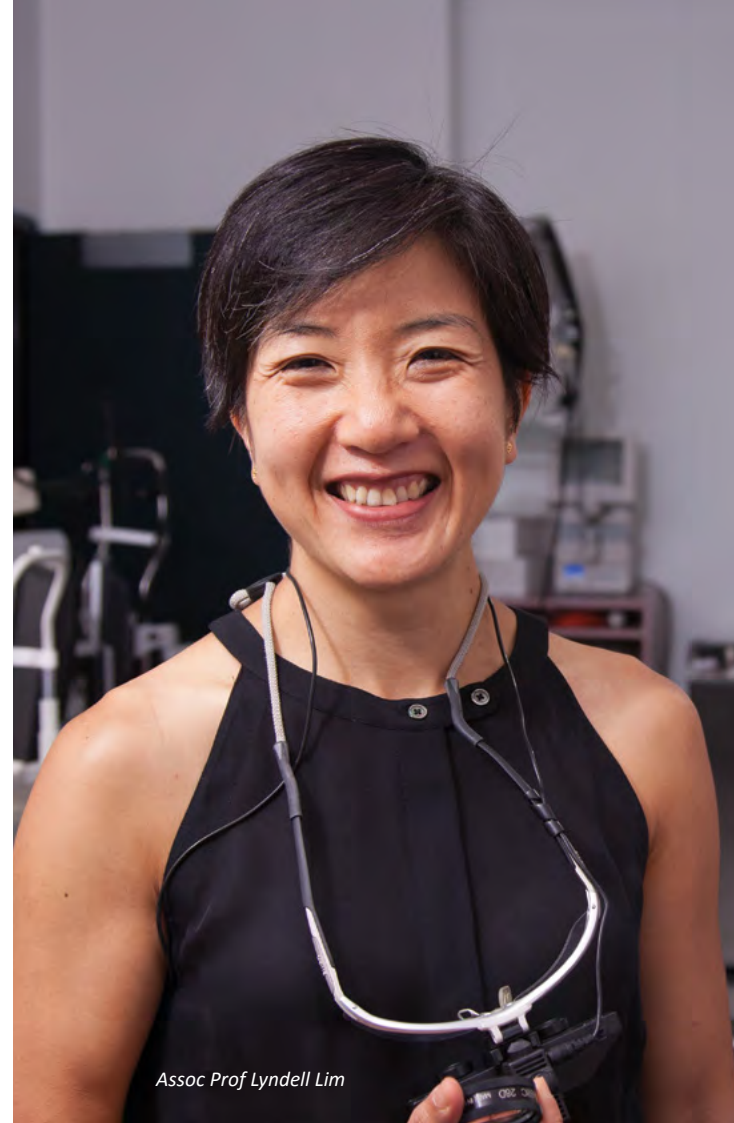
"Our trials range from smaller studies developed by local doctors, to global studies with pharmaceutical companies where we are one of many sites," said Assoc Prof Lyndell Lim, Head of CTRC.

CTRC is renowned for its team of experts which includes doctors, study coordinators, orthoptists, scientists and nurses. They are passionate about patient care and totally committed to conducting clinical trials to find new treatments for a variety of eye diseases.

In November, Assoc Prof Lim was one of five recipients of a 2016 Ramaciotti Health Investment Grant, prestigious awards worth up to \$150,000 for early career scientists to support translational health or medical research. Her grant was for research that will improve cataract surgery outcomes in patients with diabetic macular oedema.

Another important milestone for the CTRC in 2016 included the first steps towards establishing an Eye Trials Research Network (ETRN) by training staff and doing a feasibility assessment for one of CERA's satellite sites. The ETRN is a network of research sites supporting eye research trials that will include private ophthalmology practices and other universities and hospitals bringing together complementary expertise.

"We hope to improve therapeutic treatment options for patients drawn from primary to tertiary care settings and the CTRC will provide the coordinating research hub for the network," said Assoc Prof Lim.



Assoc Prof Lyndell Lim



Prof Robyn Guymer



Clinical Trials Centre group

## Pioneering new tablet-based home monitoring to detect and signal vision-threatening AMD

We now have excellent treatments to use in age-related macular degeneration (AMD) when bleeding complications occur. However, it is vital that we get to use these treatments early in the process before irreversible vision loss occurs.

Deputy Director of CERA, Prof Robyn Guymer, feels that more could be gained by working to detect the bleeding complications early than by spending years working on different molecules to treat the disease.

"In a controlled study, using a platform called Psypad, designed by collaborators at the University of Melbourne, we designed a test of retinal function, and found that people in an older age group were happy to use the technology which was delivered on an iPad, to measure their vision and that reminders did lead to more frequent testing," Prof Guymer said.

Prof Guymer continues to explore other tablet based applications such as one designed by Glance Optical to determine if a change in retinal function will be sensitive enough to detect the early signs of bleeding in the retina in those with AMD.



"The treatment I have been given is really world-class. I could not wish for anything better"

- Mr Victor Fortmann, patient





Mr Steve Hurd and Sandy



## CERA looks to the promise of driverless vehicles for the vision impaired

Imagine a world where vision impaired drivers could share the roads with everyone else...

In 2015 Prof Robyn Guymer, Dr Lauren Ayton and then student, Dr Rogan Fraser, worked on a collaborative project with the Monash University Accident Research Centre to develop a novel driving simulator assessment to determine the effect of early age-related macular degeneration on drivers. The development of this tool has enabled better understanding of the challenges experienced by people with early eye disease in activities such as driving.

The future is now closer than you think as driverless vehicles are going to revolutionise our transport system and in 2016 CERA continued to support this transformation with the appointment of Honorary Fellow, Mr Steve Hurd.

Mr Hurd, who is also Councillor for the Glenferrie Ward of the City of Boroondara, was born legally blind and holds degrees in Law and Arts. In addition to being a serving councillor, he has strong community and

government connections and is passionate about the potential of autonomous vehicles. He will champion CERA's efforts to assist and promote the development and implementation of driverless vehicle systems for the vision impaired.

*"It will be the biggest boost for independence, employment prospects and social integration we have ever seen"*

*- Mr Steve Hurd*

# Community Behind the Centre for Eye Research Australia





# Major awards



*Prof Jonathan Crowston receiving his award*

## Prof Jonathan Crowston

Prof Jonathan Crowston was recognised with the inaugural David L Epstein award, at the international annual meeting of the Association for Research in Vision and Ophthalmology in Seattle USA. He was awarded for his outstanding ongoing contribution conducting eye and vision research in glaucoma and mentorship of glaucoma clinicians and researchers.



*Prof Greg Dusting*

## Prof Greg Dusting

Prof Greg Dusting was awarded a Heart Foundation Research Medal for Lifetime Contribution to Cardiovascular Research. His award was in recognition of decades of pivotal research into cardiovascular pharmacology and his support of the discipline and students through mentorship. Early in his career, Prof Dusting and his research collaborators discovered a new compound they called 'prostacyclin' which inhibited blood clotting a discovery that led to a Nobel Prize for his mentor Sir John Vane.



*Assoc Prof Alex Hewitt receiving his award recognising him as the top-ranked NHMRC Practitioner Fellowship applicant*

## Assoc Prof Alex Hewitt

Assoc Prof Hewitt is one of Australia's leading experts in stem cell research and received recognition from the NHMRC with the accolade of top-ranked Practitioner Fellowship applicant. Assoc Prof Hewitt's research will help lay the foundation for a new generation of gene therapy. "We are currently at one of the most exciting times in medical research. The tools for biological discovery have never been sharper. During the upcoming five years, my collaborative research team will lead ongoing genetic discoveries for common and complex blinding diseases," he said.



*Prof Robyn Guymer receiving the NHMRC Elizabeth Blackburn Fellowship award*

## Prof Robyn Guymer

Prof Robyn Guymer's outstanding biomedical and clinical research career was underscored with a prestigious NHMRC Elizabeth Blackburn Fellowship, where she was recognised as the top-ranked female Research Fellowship applicant in the Clinical Science and Medicine category. Prof Guymer also received the Carolyn K McGillvray award for Macular Degeneration Research from the USA-based BrightFocus Foundation.

# The eye as a window to the secrets of the brain

Dr Xavier Hadoux, a post-doctoral researcher at CERA, is using an advanced imaging technology developed by NASA, called a hyperspectral camera, to study the human retina. Dr Hadoux hails from France where he began his studies with a Bachelor and Masters of Engineering in signal and image processing. He completed his PhD studying agricultural crop health using the hyperspectral camera and is now applying those techniques to vision research.

How did he come to work in eye research?

"After my PhD, I wanted to use the same type of technology in the medical research world and when I told Prof Jonathan Crowston, about the technology, he saw the immense possibilities it could bring to eye research," said Dr Hadoux.

Now, thanks to the strong support of Prof Crowston; CERA Principal Investigator, Dr Peter van Wijngaarden; and generous financial contributions from the Yulgilbar Foundation and the Joan Margaret Ponting Charitable Trust to purchase the camera, Dr Hadoux is using the same NASA technology at CERA to unlock the secrets of Alzheimer's disease and other conditions.

"There is good evidence that a protein plaque, called beta amyloid, starts to accumulate in the brain and the retina of Alzheimer's patients. It accumulates well before the first symptoms of the disease are detected, modifying how light is reflected from the back of the eye to the camera.

It is this difference in the reflected light that we want to measure and we are fortunate to be the first research group in the world to translate this research in a clinical setting with real Alzheimer's patients," said Dr Hadoux.

CERA's hyperspectral camera holds enormous hope and promise for research into other brain diseases.

"To date, we have focused on Alzheimer's, but doing research at CERA means we have unique access to patients with glaucoma, macular degeneration and diabetic retinopathy. The camera may reveal clues about these and other debilitating diseases," said Dr Hadoux.



**DR XAVIER HADOUX**

**'I cannot think of any project at CERA where the goal is not to make a difference and save people's sight'**  
– Dr Xavier Hadoux



# Student profiles



**From bench to bedside: PhD student Sandra Staffieri wants to provide parents with the power of knowledge to save their child's sight or potentially their life**

## MS SANDRA STAFFIERI

Ms Sandra Staffieri is in her second year of her PhD at CERA. Ms Staffieri began her career as a Clinical Orthoptist at the Royal Children's Hospital. It was there she developed an interest and passion for the study of retinoblastoma - the most common eye cancer that develops in one or both eyes of children from before birth to the age of five.

Retinoblastoma is rare, but it accounts for 9% of all cancers in children under the age of one.

Prof David Mackey recognised her talent and nine years ago she was invited to work at CERA as a Research Orthoptist in the Clinical Genetics group.

"I had a lot of questions as a clinician and it was exciting to be part of an organisation where you could answer those questions through research," said Ms Staffieri.

Her transition to undertaking a PhD came from a desire to tackle the issue of parents not recognising or responding to the early signs of the disease.

"My PhD research project will examine delayed diagnosis of retinoblastoma and develop a simple, sustainable awareness program for all new parents to be alert to the early, most common signs of retinoblastoma: a white pupil or a turned eye."

These two most common presenting signs of retinoblastoma can often seem innocuous. They might be missed or ignored due to their perceived 'normality', infrequency, or because the child is otherwise well.

Ms Staffieri looks forward to completing her PhD in the next few years, with the support of her supervisors, Assoc Prof Alex Hewitt, Dr Gwyneth Rees, Dr Paul Sanfilippo, and Prof David Mackey. She hopes to translate this work to developing countries where early diagnosis is a matter of life and death.

"Parents often don't recognise, and therefore respond, to the early signs of this disease. I am really excited and grateful to be working on a project that has the potential to make a difference to future children's vision or survival - just by giving their parents the knowledge to change that," she said.



**Uncovering the genetic basis of inherited eye disease - PhD student Moeen Riaz wants to find better treatments for AMD patients**

## MR MOEEN RIAZ

PhD student, Moeen Riaz is finishing his doctorate at CERA in Molecular Genetics under the supervision of Principal Investigators Profs Paul Baird and Robyn Guymer. With an interest in retinal diseases, Mr Riaz started his work in the field of molecular genetics in his home country of Pakistan.

"In Pakistan, my work focussed on finding the genetic variations associated with the risk of inherited eye and heart diseases, by going and taking genetic samples from families from around the country."

Mr Riaz was interested in pursuing his PhD at an internationally renowned institute with a group of researchers working on eye diseases. He came across CERA from literature searches and became familiar with Prof Baird's extensive work.

"I still remember the date—22 February 2013—when I received one of the happiest pieces of news of my life, I learned I had been awarded a scholarship for my PhD studies at CERA."

Mr Riaz's research at CERA focusses on the genetic basis of eye disease. Specifically, he is identifying genes, or genetic variations that affect patients'

## Address depressive symptoms in Australians with vision impairment

PhD candidate Ms Edith Holloway, under the supervision of Dr Gwyneth Rees, Head of Behavioural Research in Ophthalmology at CERA, completed a world-first trial in partnership with Vision Australia and beyondblue to address depressive symptoms in Australian adults with vision impairment.

Vision Australia staff were trained to deliver an evidence-based psychological treatment for depression over the

telephone called Problem-Solving Treatment for Primary Care (PST-PC).

Results showed strong evidence that PST-PC can have sustained benefits for improving depressive symptoms, and may also improve clients' quality of life and emotional well-being.

Vision Australia seeks to roll out this model as an ongoing service in 2017 to support their clients with depressive symptoms.

response to treatment for age-related macular degeneration (AMD).

"AMD is a blinding disease and the only treatment for it is an injection into the eye, called anti-VEGF," he explained. "I want to find out how the genetic code and clinical parameters influence the anti-VEGF treatment outcome in AMD patients."

He is hopeful his research could eventually lead to personalising treatment for AMD and help with future drug development.

"My journey at CERA has taught me valuable technical skills and broadened my vision in eye research. I received great mentorship under the supervision of Profs Baird and Guymer and the Ocular Genetics team, and had great opportunities to collaborate and participate in large consortium studies," he said.





“CERA’s vision is close to my heart, that’s why I chose donations instead of presents for my 90th birthday”

- Mrs Dorothea Carmichael



Ms Kiera Young, Clinical Trial Coordinator, CERA, Mrs Dorothea Carmichael and Mr Benjamin Nuttall, Philanthropy Coordinator, CERA

## Dorothea’s 90th birthday gift to vision research

“CERA’s vision is close to my heart, that’s why I chose donations instead of presents for my 90th birthday,” said Dorothea Carmichael of Brighton, Victoria.

Dorothea has generously made regular donations to CERA at Easter and Christmas for more than ten years. She suffers from macular degeneration which is one of CERA’s most important research priorities.

“I decided before my 90th birthday that I’d ask my friends to donate to CERA instead of buying presents,” said Dorothea. “It’s wonderful to have a gift that will go on and help others long into the future.”

Gifts and bequests in a person’s Will are ways CERA supporters can make a real difference. Every gifted dollar contributes to research that has the potential to change people’s lives by saving their sight.

“Gifts to CERA are tax deductible and go to research projects that can and will change lives for the better,” said Prof Jonathan Crowston.

### Supporting CERA’s work: a gift in your Will

A gift in your Will is one of the most effective ways to support CERA’s work. By including a gift in your Will, your support for new medical discoveries can continue long into the future.

You could help buy a piece of equipment so researchers can study eye diseases in the laboratory; you can help talented students or young researchers to become the next leaders in eye research by establishing a scholarship or fellowship; or you can support an area of research close to you and your family’s heart.

You can make a lasting difference. CERA will work with you to make sure your gift reflects your values and interests.

If you have any questions or comments, please call our Philanthropy team on +61 3 9929 8424.



The Shah family and Ms Anne Rogan with Governor of Victoria Linda Dessau AC, Honourable Judge Howard and Dr Graeme Pollock

## LEDS and CERA, a special relationship providing the gift of sight now and into the future

Melbourne’s Lions Eye Donation Service (LEDS) celebrated its 25th anniversary in 2016 with a celebration attended by donor families and recipients, as well as the Governor of Victoria and Patron of CERA, the Honourable Linda Dessau AC.

Since 1991, LEDS has facilitated over 7,500 corneal transplants from over 4,600 donors, providing the gift of sight in partnership with CERA, the University of Melbourne and the Royal Victorian Eye and Ear Hospital.

2016 saw record numbers of donations for LEDS with all tissue utilised.

“In 1991 there were 180 people waiting for a corneal transplant in Victoria,” said Dr Graeme Pollock, Director of LEDS. “Today, we are proud to say that most patients referred to us for a corneal transplant will receive a new cornea within weeks.”

Her Excellency, The Governor of Victoria, expressed her deep admiration for 25 years of dedicated work by LEDS and enjoyed a tour of CERA laboratories.

Greg and Alison Shah, also present at the event, know full well the impact of a LEDS donation. Their seven year old daughter Sienna received a corneal transplant in 2014.

The relationship between CERA and Lions is a very special and enduring one. In addition to their support for LEDS, Lions provide valuable funding for CERA’s research through endeavours such as the Lions Ride for Sight which, in 2016, raised \$48,000 for CERA’s research.

Another recipient of Lions support is CERA’s Head of Corneal Research and President of the Royal Australian and New Zealand College of Ophthalmologists, Assoc Prof Mark Daniell. “The consistent support of Lions over the years has been absolutely critical to helping me advance our Corneal Research program. Thank you, Lions!” he said.



Lions Ride for Sight riders and supporters - Image courtesy of Lions Ride for Sight, District 201V3



# Event engagement



Ms Alexandra Wardle, Novartis Pharmaceuticals Australia Pty Ltd, Mr Luxin Wang, Alcon/Novartis Country General Manager, ANZ and Prof Jonathan Crowston

## Alcon/CERA Visiting Professor Program

CERA welcomes international leaders in ophthalmology research as part of the Alcon/CERA Visiting Professor Program.

We thank Alcon Laboratories for their continued support of this important educational lecture series.

Alcon/CERA Visiting Professors:

- Prof Minas Coroneo AO, Department of Ophthalmology, University of NSW
- Assoc Prof Richard Mills, Flinders Medical Centre
- Prof Calvin Pang and Prof Clement Tham, Department of Ophthalmology and Visual Sciences, Chinese University of Hong Kong



CERA presenters - Dr Sanj Wickremasinghe, Dr Peter van Wijngaarden, Dr Gwyneth Rees and Assoc Prof Lyndell Lim

## Community Information Forums

CERA hosted four Community Information Forums in 2016 on common eye diseases - glaucoma, age-related macular degeneration, diabetic retinopathy, and keratoconus.

Featuring expert guest speakers from CERA and the wider eye research community, attendees learnt about the latest research advances in the prevention and treatment of eye diseases from Australia's top experts in eye research.

» *Talk topics and audio available on our website at [www.cera.org.au](http://www.cera.org.au)*



Grand-daughter Harriet and Prof Gerard Crock's twin brother Harry

Prof Crowston, Prof Doug Coster AO, Mrs Crock and Prof Andrew Cuthbertson AO

Coster family with Honourable Bishop Ian George AO

## Annual Gerard Crock Lecture

**"Doug was exactly the right mix of science and popular knowledge...a real triumph"**

- Mrs Jacqueline Crock (the late Prof Gerard Crock's wife)

Our seventh Gerard Crock Lecture welcomed guest speaker Emeritus Prof Doug Coster AO on "The art of seeing and the seeing of art." Emeritus Prof Coster is a retired academic and ophthalmologist whose principal interest was in corneal transplantation, laboratory research into transplantation biology and large-scale clinical research. At the event, he spoke of his extraordinary experience in ophthalmology, science, research and art.

Emeritus Prof Coster's insights into the painting and drawing techniques of Renaissance and modern artists delighted everyone present. The topic was very appealing particularly to the Crock family many of whom were in attendance. Mr Peter Crock said his father would have been very pleased with the lecture, as he was particularly keen on the art of the Renaissance.

» *Podcast interview and video of the lecture are available on our website [www.cera.org.au](http://www.cera.org.au)*



2016 CERA Scientific Exchange award winners

## Scientific Exchange and Awards

The 2016 CERA Scientific Exchange and Awards had over 100 guests including staff, students, stakeholders, and donors who came together for the opportunity to get up-close with some of our best and brightest researchers at CERA.

CERA's Board Director Mr Andrew Cowlishaw, presented the annual CERA awards alongside SmartSalary and Thomson Geer representatives who kindly sponsored two categories.

The CERA Award was presented by Mr Clinton Symons and Ms Irene Trakossas from SmartSalary, and the Excellence in Research Award was presented by Mr Chris Hartigan from Thomson Geer.

Recognising outstanding achievements and contribution from staff and students in 2015/2016, the award winners in each category were:

- Excellence in Research – The National Eye Health Survey Team
- Excellence in Research Support – Ms Nicole Tindill
- Excellence in Community Engagement & Knowledge Transfer – Dr Srujana Sahebjada
- Excellence in Teaching & Training – The Human Resources Team
- Outstanding Contribution of a Student – Dr Eamonn Fahy
- The CERA Award – The National Eye Health Survey Team

"CERA provides fantastic information sessions to help us stay abreast of developments in eye research"

- Event attendee



# Abridged audited financial statement <sup>(i)</sup>

**The Centre for Eye Research Australia (ABN 72 076 481 984)**  
for the year ended 31 December 2016.

STATEMENT OF COMPREHENSIVE INCOME		
	2016	2015
Revenue		
Federal Government	4,405,969	4,326,781
State Government <sup>(ii)</sup>	950,882	1,080,226
Charitable contributions & other income	<u>12,063,116</u>	<u>9,533,268</u>
Total revenue from operating activities	17,419,967	14,940,275
Less expenditure on operating activities	18,728,113	16,759,214
Surplus/(deficit) on operating activities	(1,308,146)	(1,818,939)
Net financial income	536,783	346,645
Capital grants	<u>0</u>	<u>0</u>
Net surplus/(deficit) <sup>(iii)</sup>	(771,363)	(1,472,294)
STATEMENT OF FINANCIAL POSITION		
Current assets	9,901,477	9,260,492
Non-current assets	<u>1,615,929</u>	<u>2,056,327</u>
Total assets	11,517,406	11,316,819
Current liabilities		
Trade and other payables	4,088,341	3,522,402
Employee benefits	<u>1,281,770</u>	<u>844,811</u>
Total current liabilities	5,370,111	4,367,213
Non current liabilities	155,480	396,336
Total liabilities	<u>5,525,591</u>	<u>4,763,549</u>
Net assets	5,991,815	6,553,270
Accumulated funds	704,974	1,940,479
Research reserve <sup>(iv)</sup>	<u>5,286,841</u>	<u>4,612,791</u>
Total equity	5,991,815	6,553,270

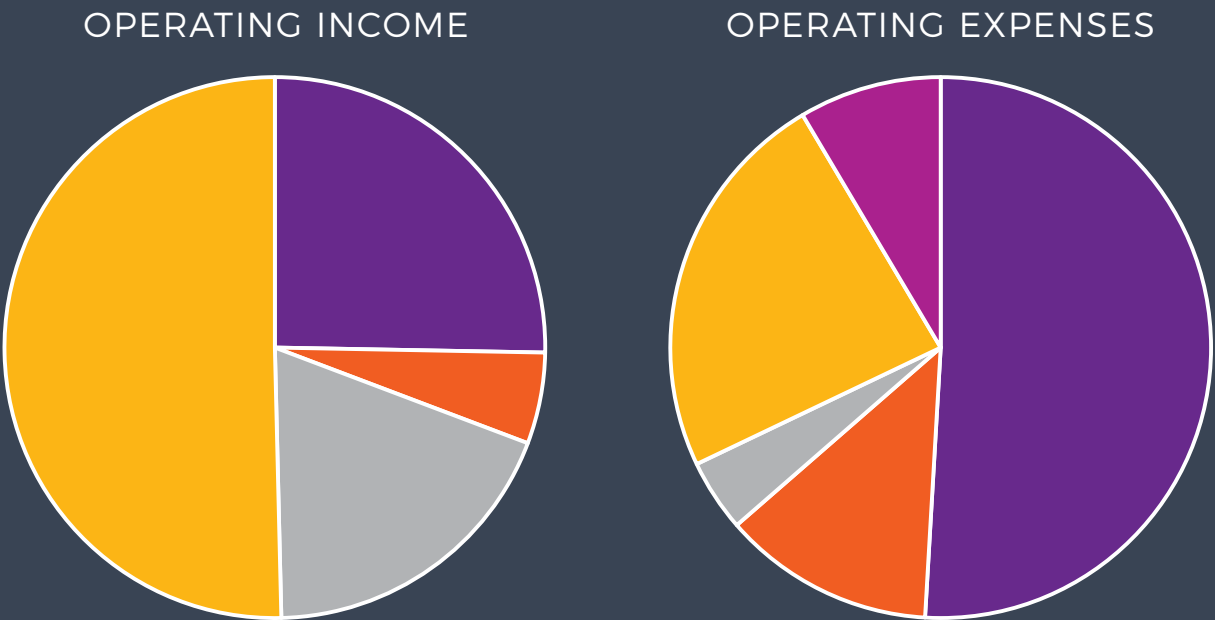
- (i) This abridged audited financial statement has been extracted from the full audited financial statements which include more detailed disclosures.
- (ii) CERA receives Operational Infrastructure Support from the Victorian Government.
- (iii) The year resulted in a deficit of (\$771,363). Adding back depreciation and unrealised loss on financial assets, the result for the year is a surplus of \$346,181.
- (iv) CERA operates as a not-for-profit organisation. Accordingly, prior years' accumulated surpluses are held in the form of working capital to support future research projects and operations.



CENTRE FOR  
**Eye Research  
Australia**  
1996-2016

*Celebrating 20 years as the Centre for Eye Research Australia*

## 2016



### INCOME

Federal Government Grants	4,405,969	25%
State Government Grants	950,882	5%
Clinical Trials/ Research Contracts & Other Income	3,286,556	19%
Donations/Bequests/Research Foundations	8,776,560	51%
Total	17,419,967	100%

### EXPENSES

Direct Research Expenditure	9,536,862	50%
Laboratory Support Expenditure	2,374,371	13%
Buildings/Facilities Expenditure	807,494	4%
Administration	4,411,986	24%
Other	1,597,399	9%
Total	18,728,113	100%





CENTRE FOR  
**Eye Research  
Australia**

#### **Centre for Eye Research Australia**

ABN: 72 076 481 984



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For regular updates on CERA research visit:



[www.cera.org.au](http://www.cera.org.au)

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Changing lives.**

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